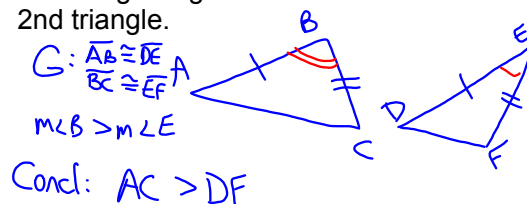


5.6 Inequalities in Two Triangles and Indirect Proof

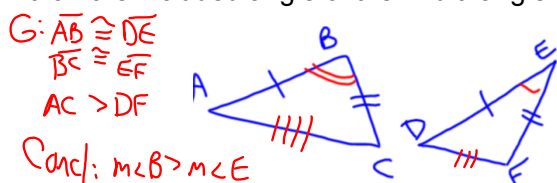
Theorem 5.13-Hinge Theorem—If 2 sides of one triangle are congruent to 2 sides of another triangle, and the included angle of the 1st triangle is greater than the included angle of the 2nd triangle, then the 3rd side of the 1st triangle is greater than the 3rd side of the 2nd triangle.



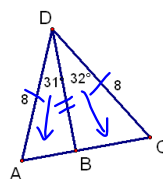
gsp demo

Theorem 5.14-Converse of the Hinge

Theorem—If 2 sides of one triangle are congruent to 2 sides of another triangle, and the 3rd side of the 1st triangle is greater than the 3rd side of the 2nd triangle, then the included angle of the 1st triangle is greater than the included angle of the 2nd triangle.

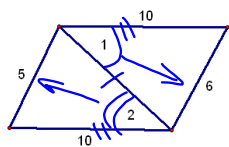


Compare the listed sides or angles.



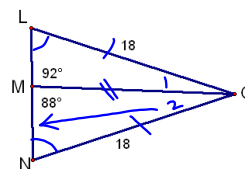
$BC > AB$

Compare the listed sides or angles.



$$m\angle 1 \text{ } \bigcirc \text{ } m\angle 2$$

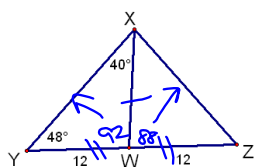
Compare the listed sides or angles.



$$LM \text{ } \bigcirc \text{ } MN$$

$$m\angle 2 > m\angle 1$$

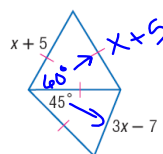
Compare the listed sides or angles.



$$XZ \text{ } \bigcirc \text{ } XY$$

Write an inequality to describe the possible values of x .

5.



$$x > -5$$

$$3x - 7 > 0$$

$$x > \frac{7}{3}$$

$$x + 5 > 3x - 7$$

$$6 > x$$

$$x < 6$$

$$\frac{7}{3} < x < 6$$

Write an inequality to describe the possible values of x .

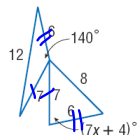
$$7x + 4 < 140$$

$$7x < 136$$

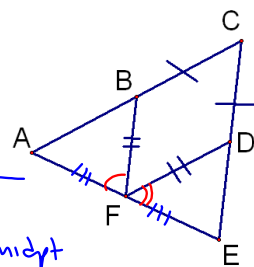
$$x < 19\frac{2}{7}$$

$$-\frac{4}{7} < x < 19\frac{2}{7}$$

6.

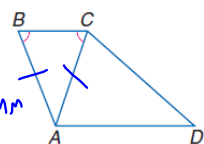


Given: $\overline{BF} \cong \overline{DF}$; $\overline{BC} \cong \overline{CD}$;
F is the midpoint of \overline{AE} ;
 $m\angle DFE > m\angle AFB$
Prove: $CE > AC$



- | | |
|---------------------------------------|------------------|
| ① \sim | ① Given |
| ② $\overline{AF} \cong \overline{FE}$ | ② def of midpt |
| ③ $DE > AB$ | ③ Hinge thm |
| ④ $BC = CD$ | ④ def of \cong |
| ⑤ $DE + CD > AB + BC$ | ⑤ Add. |
| ⑥ $DE + CD = CE$
$AB + BC = AC$ | ⑥ SAP |
| ⑦ $CE > AC$ | ⑦ Subst. |

38. Given: $\angle B \cong \angle ACB$
Prove: $AD + AB > CD$



- | | |
|---------------------------------------|----------------------|
| ① \sim | ① Given |
| ② $AD + AC > CD$ | ② Δ Ineq. thm |
| ③ $\overline{AB} \cong \overline{AC}$ | ③ BAT conv. |
| ④ $AB = AC$ | ④ def of \cong |
| ⑤ $AD + AB > CD$ | ⑤ Subst |

HW p338-340

#s 1-9, ~~11-13~~, 16-18, ~~24~~

Attachments

Hinge_thm.gsp